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| 10/036,646 | 11/07/2001 | Sujatha Ramanujan | 83509NAB | 5815 |

7590

07/19/2004

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| EXAMINER |
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SHAPIRO, LEONID

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| ART UNIT | PAPER NUMBER |
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2673

DATE MAILED: 07/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/036,646

Applicant(s)

RAMANUJAN, RUJATHA

Examiner

Leonid Shapiro

Art Unit

2673

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14, 17-21, 84-86 and 88-91 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 17-21, 84-86 and 88-91 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 1899 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Drawings

1. The drawings were received and approved on 04/19/04. These drawings are Figures 1-8.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations of claims 91, 92-93: "image-carrying monochromatic beam from sequential color digital data" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of

any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The limitations of claims 91, 92-93: "image-carrying monochromatic beam from sequential color digital data" are not shown in the Specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 91, 93-94 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The newly introduced limitations of claim 1: "an image-carrying monochromatic beam" and "such that a composite time integrated image carrying beam is monochromatic" contradicted to limitations (a), (b): "a beam of multicolor light".

It is not clear, at what point beam of multicolor light become monochromatic?

Notice, that three segments of color wheel according to Fig. 4, are not monochromatic R, G, and B, as in case of color display, but already have different

transmissions for RGB components of white light source. Only after temporal integration of three segments by human eye, composite image appears as tinted monochrome image.

The same related to newly introduce independent claims 91, 93-94.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 6-7, 9-10, 18-19, 21, 84-86, 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards (US Patent No. 6,388,661 B1) in view of Konno et al. (US Patent No. 5,327,229).

As to claim 1, Richards teaches a display apparatus for projection of an image-carrying beam from digital data (See Fig. 2a, item 306, Col. 2, Lines 58-67) on display surface (See Fig. 1, items 204, 210, in description See from Col. 1, Line 64 to Col. 2, Line 29), the apparatus comprising: a light source for providing a beam of multicolor light (See Fig. 1, item 200, in description See Col. 1, Lines 65-66); a variable filter disposed to provide a periodic attenuation of a range of component wavelengths of beam of multicolor light in order to provide tinted beam (See Fig. 1, item 212, in description See Col. 2, Lines 21-22); spatial light modulator for modulating variably tinted beam according to color digital data (See Fig. 2a, item 306, Col. 2, Lines 58-67)

to provide image-carrying beam (See Fig. 1, item 204, in description See from Col. 1, Line 64 to Col. 2, Line 3).

Richards does not show a control logic processor for modulating a bias voltage to spatial light modulator, bias voltage modulation synchronous with periodic attenuation of variable filter.

Konno et al. teaches a control logic processor (See Fig. 2,item 30) for modulating a bias voltage to spatial light modulator, bias voltage modulation synchronous with periodic attenuation of variable filter (See Figs. 2-4, items 20, 37, col. 4, lines 43-68).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teachings of Konno et al. into Richards system in order to perform a tinted monochrome (reddish) on the screen (See Col. 2, Lines 63-68 in Konno et al. reference).

As to claim 84, Richards teaches in a digital display apparatus (See Fig. 1, items 204, 210, in description See from Col. 1, Line 64 to Col. 2, Line 29) using a spatial light modulator to modulate a monochromatic image for projection onto a display surface (See Fig. 1, item 204, in description See from Col. 1, Line 64 to Col. 2, Line 3), a method for adjusting the hue of monochromatic image comprising: providing a light source in a repeated sequence (See Fig. 1, item 200, in description See Col. 1, Lines 65-66); wherein component colors are attenuated (See Fig. 1, item 212, in description See Col. 2, Lines 21-22).

Richards does not show providing to spatial light modulator a repeated sequence of variable bias voltages in synchronization with repeated sequence of component color attenuation, the level of each variable bias voltage being adjustable in order to affect adjustment of the hue of monochrome image.

Konno et al. teaches providing to spatial light modulator a repeated sequence of variable bias voltages in synchronization with repeated sequence of component color attenuation, the level of each variable bias voltage being adjustable in order to affect adjustment of the hue of image (See Figs. 2-4, items 20, 37, Col. 4, Lines 43-68).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teachings of Konno et al. into Richards system in order to perform a tinted monochrome (reddish) on the screen (See Col. 2, Lines 63-68 in Konno et al. reference).

As to claim 3, Richards teaches SLM is transmissive liquid crystal device (See Fig. 3, item 401, in description See Col. 3, Lines 26-44).

As to claims 6-7, Richards teaches viewing screen which could be a direct-view display surface or a projection screen (See Fig. 1, item 210, in description See Col. 2, Lines 14-15).

As to claims 9-10, Richards teaches projection optics for projection of image-carrying beam onto direct-view surface or projection screen (See Fig. 1, item 208, in description See Col. 2, Lines 14-15).

As to claims 18-19, 85-86 Richards teaches variable filter is stationary and rotates in the path of light source (See Fig. 1, item 212, in description See Col. 2, Lines 17-29).

As to claim 21, Richards teaches light source comprises LED (See in Description Col. 2, Lines 30-34).

As to claim 91, Richards teaches a display apparatus for projection of an image-carrying beam from sequential color digital data (See Fig. 2a, item 306, Col. 2, Lines 58-67) on display surface (See Fig. 1, items 204, 210, in description See from Col. 1, Line 64 to Col. 2, Line 29), comprising: a light source for providing a beam of multicolor light (See Fig. 1, item 200, in description See Col. 1, Lines 65-66); a variable filter disposed to provide a periodic attenuation of a range of component wavelengths of beam of multicolor light in order to provide tinted beam (See Fig. 1, item 212, in description See Col. 2, Lines 21-22); spatial light modulator for modulating variably tinted beam according to color digital data to provide image-carrying beam (See Fig. 1, item 204, in description See from Col. 1, Line 64 to Col. 2, Line 3).

Richards does not show a control logic processor for modulating a bias voltage to spatial light modulator, bias voltage modulation synchronous with periodic attenuation of variable filter.

Konno et al. teaches a control logic processor (See Fig. 2, Item 30) for modulating a bias voltage to spatial light modulator, bias voltage modulation synchronous with periodic attenuation of variable filter (See Figs. 2-4, items 20, 37, col. 4, lines 43-68).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teachings of Konno et al. into Richards system in order to

perform a tinted monochrome (reddish) on the screen (See Col. 2, Lines 63-68 in Konno et al. reference).

6. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards and Konno et al. as applied to claim 1 above, and further in view of Tanaka et al. (US Patent No. 6,388,649 B1).

As to claim 2, Richards and Konno et al. do not show a reflective liquid crystal device as spatial light modulator.

Tanaka et al. teaches a reflective liquid crystal device as spatial light modulator (See Fig. 21, item 2103).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teachings of Tanaka et al. into Richards and Konno et al. apparatus to perform a monochrome on the screen (See Col. 28, Lines 47-48 in Tanaka et al. reference).

As to claim 4, Richards and Konno et al. do not show SLM is digital micromirror device.

Tanaka et al. teaches SLM is digital micromirror device (See Fig. 21, item 2103).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teachings of Tanaka et al. into Richards and Konno et al. apparatus to perform a monochrome on the screen (See Col. 28, Lines 47-48 in Tanaka et al. reference).

7. Claims 5 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards and Konno et al. as applied to claim 1 above, and further in view of Dawson (Pub. NO.: US 2002/0021832 A1).

Richards and Konno et al. do not show variable filter modulates birefringence.

Dawson teaches Variable Birefringence Polarized Interference Filters (See in description page 12, paragraph 0247).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Dawson Birefringence Filters in Richards Konno et al. apparatus to provide a beam of multicolor light.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards and Konno et al. as applied to claim 1 above, and further in view of Eaton (US Patent No. 4,876,608).

Richards and Konno et al. do not show display surface is image-retentive.

Eaton teaches a charge retentive surface (See Fig. 1, items 16, 18, 22, Col. 4, Lines 34-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Eaton charge retentive device in Richards and Konno et al. apparatus to retain an image.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards and Konno et al. as applied to claim 1 above, and further in view of Berlin (US Patent No. 5,815,303).

Richards and Konno et al. do not show intensity control for adjusting the intensity of light source.

Berlin teaches intensity control for adjusting the intensity of light source (See Fig. 1, item 50, Col. 10, Lines 41-45).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Berlin into Richards and Konno et al. apparatus to improve an image.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards and Konno et al. as applied to claim 1 above, and further in view of Washburn (US Patent No. 5,585,691).

Richards and Konno et al. do not show an operator control for hue adjustment.

Washburn teaches an operator control for hue adjustment (See Fig. 7, item 23-05, Col. 23, Lines 39-59).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Washburn into Richards and Konno et al. apparatus to improve an image.

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Washburn, Richards and Konno et al. as applied to claim 12 above, and further in view of Wang (US Patent No. 6,278,540 B1).

Washburn, Richards and Konno et al. do not show an operator control bias voltage to the spatial light modulator.

Wang teaches an operator control bias voltage to the spatial light modulator (See Fig. 19, item 1010A, 1010B, Col. 9, Lines 8-22).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Wang into Washburn, Richards and Konno et al. system to improve an image.

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Washburn, Richards and Konno et al. as applied to claim 12 above, and further in view of Wang (US Patent No. 6,278,540 B1).

Washburn, Richards and Konno et al. do not show intensity control for adjusting the intensity of light source.

Berlin teaches intensity control for adjusting the intensity of light source (See Fig. 1, item 50, Col. 10, Lines 41-45).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Berlin into Washburn, Richards and Konno et al. apparatus to improve an image.

13. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Richards and Konno et al. as applied to claim 1 above, and further in view of Patel et al. (US Patent No. 4,935,820).

Richards and Konno et al. do not show color filter is interchangeable.

Patel et al. teaches color filter is interchangeable (See Fig. 1, item 7, Col. 5, Lines 46-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Patel et al. into Richards and Konno et al. apparatus to improve an image.

14. Claims 88-90, 92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards and Konno et al. as applied to claim 1 above, and further in view of Krasieva et al. (US Patent No. 5734,498).

Konno et al. teaches a first timing segment a red bias is applied to spatial light modulator (SLM), red image transmitted to SLM, a second timing segment a green bias is applied to spatial light modulator (SLM), green image transmitted to SLM, a third timing segment a blue bias is applied to spatial light modulator (SLM), blue image transmitted to SLM (See Figs. 2-4, items 20, 37a, 37b, 37c, Col. 4, Lines 42-68)

Richards and Konno et al. do not show a blue/green transmissive filter portion attenuates the red light, red/blue transmissive filter portion attenuates the green light, red/green transmissive filter portion attenuates the blue light.

Krasieva et al. teaches a blue/green transmissive filter portion attenuates the red light, red/blue transmissive filter portion attenuates the green light, red/green transmissive filter portion attenuates the blue light (See Col. 11, Lines 34-39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Krasieva et al. into Richards and Konno et al. apparatus to improve an image.

15. Claims 93-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richards in view of Konno et al. and Krasieva et al.

As to claim 93, Richards teaches a display apparatus for projection of an image-carrying beam from sequential color digital data (See Fig. 2a, item 306, Col. 2, Lines 58-67) on display surface (See Fig. 1, items 204, 210, in description See from Col. 1, Line 64 to Col. 2, Line 29), comprising: a light source for providing a beam of multicolor light (See Fig. 1, item 200, in description See Col. 1, Lines 65-66); a variable filter disposed to provide a periodic attenuation of a range of component wavelengths of beam of multicolor light in order to provide tinted beam (See Fig. 1, item 212, in description See Col. 2, Lines 21-22); spatial light modulator for modulating variably tinted beam according to color digital data to provide image-carrying beam (See Fig. 1, item 204, in description See from Col. 1, Line 64 to Col. 2, Line 3).

Richards does not show a control logic processor for modulating a bias voltage to spatial light modulator, bias voltage modulation synchronous with periodic attenuation of variable filter.

Konno et al. teaches a control logic processor (See Fig. 2, item 30) for modulating a bias voltage to spatial light modulator, bias voltage modulation synchronous with periodic attenuation of variable filter (See Figs. 2-4, items 20, 37, col. 4, lines 43-68).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teachings of Konno et al. into Richards system in order to perform a tinted monochrome (reddish) on the screen (See Col. 2, Lines 63-68 in Konno et al. reference).

Konno et al. teaches a first timing segment a red bias is applied to spatial light modulator (SLM), red image transmitted to SLM, a second timing segment a green bias is applied to spatial light modulator (SLM), green image transmitted to SLM, a third timing segment a blue bias is applied to spatial light modulator (SLM), blue image transmitted to SLM (See Figs. 2-4, items 20, 37a, 37b, 37c, Col. 4, Lines 42-68)

Richards and Konno et al. do not show a blue/green transmissive filter portion attenuates the red light, red/blue transmissive filter portion attenuates the green light, red/green transmissive filter portion attenuates the blue light.

Krasieva et al. teaches a blue/green transmissive filter portion attenuates the red light, red/blue transmissive filter portion attenuates the green light, red/green transmissive filter portion attenuates the blue light (See Col. 11, Lines 34-39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Krasieva et al. into Richards and Konno et al. apparatus to improve an image.

As to claim 94, Richards teaches a method for projection of an image-carrying beam from sequential color digital data (See Fig. 1, items 204, 210, in description See from Col. 1, Line 64 to Col. 2, Line 29), comprising: projecting a beam of multicolor light (See Fig. 1, item 200, in description See Col. 1, Lines 65-66).

Richards does not show applying a first, second and third bias voltage to SLM and applying a first, second and third color image data signal to SLM.

Konno et al. teaches a first timing segment a red bias is applied to spatial light modulator (SLM), red image transmitted to SLM, a second timing segment a green bias is applied to spatial light modulator (SLM), green image transmitted to SLM, a third timing segment a blue bias is applied to spatial light modulator (SLM), blue image transmitted to SLM (See Figs. 2-4, items 20, 37a, 37b, 37c, Col. 4, Lines 42-68).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teachings of Konno et al. into Richards system in order to perform a tinted monochrome (reddish) on the screen (See Col. 2, Lines 63-68 in Konno et al. reference).

Richards and Konno et al. do not show attenuating a first, second and third wavelength of beam of multicolor light.

Krasieva et al. teaches a blue/green transmissive filter portion attenuates a first, second and third wavelength of beam of multicolor light (the red light, red/blue transmissive filter portion attenuates the green light, red/green transmissive filter portion attenuates the blue light and so on) (See Col. 11, Lines 34-39).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate teaching of Krasieva et al. into Richards and Konno et al. apparatus to improve an image.

Response to Amendment

16. Applicant's arguments filed on 04/19/04 with respect to claims 1-14, 17-21, 84-86, 88-94 have been considered but are moot in view of the new ground(s) of rejection.

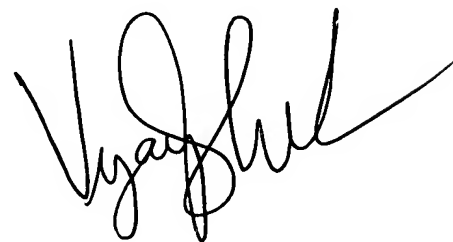
Telephone inquire

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Shapiro whose telephone number is 703-305-5661. The examiner can normally be reached on 8 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 703-305-4938. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ls 07.02.04

A handwritten signature in black ink, appearing to read 'Vijay Shankar', with a stylized, cursive script.

**VIJAY SHANKAR
PRIMARY EXAMINER**